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Abstract

ATOMIC ENERGY FOR SOCIETY AND THE BALANCE BETWEEN HAZARD AND GAIN

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The health problems created by atomic energy thus far in all of its manifestations, and for the foreseeable future in its projected peacetime applications, are not significantly different, quantitatively or qualitatively, from many other of the environmental health problems facing our society. The way in which the health problems associated with radiation have emerged, and have continued to be presented to the public, distinguishes - and, in the considered view of many responsible observers, overemphasizes - the hazard of the peacetime applications in relation to the substantial benefits which can accrue to society from an orderly development of the atomic-energy industry.

It should be stressed that, with more than twenty years of experience and some millions of man-years exposure to radiation in the atomic energy industry, and with a medical scrutiny as good as or better than that used for identifying injury to other occupational hazards, not a single instance of injurious effect has been observed in individuals whose exposure has not exceeded the permissible limits. Although injury to radiation has occurred, this has been found only in cases of true accident, where the levels of exposure have greatly exceeded the acceptable threshold limits because of accidental circumstances, due to a failure of man or machine in the same sense as an accidental chemical release or explosion. In applying more sophisticated measures of injury than are customarily used in assessing other occupational hazards, such as shortening of life span or of genetic effect, the concern for the radiation hazard has far outstripped that for other equally potentially hazardous agents. Again, it must be emphasized that no such effects have been demonstrated where present accepted threshold limits have not been exceeded. The implication is not that

we should ignore the evidence of hazard for radiation, but rather should place it in proper perspective in relation to other environmental factors affecting health so we do not unduly penalize a development with such great promise of benefit.

In the area of control of occupational exposures to radiation, much more stringent requirements have been adopted than for other equally hazardous industrial agents. For example, to obtain a relatively small thickness gauge for use in industry, one must register the source with the state agency having responsibility for radiation control, demonstrate the safety precautions for all projected uses, and show that qualified personnel are available to supervise the installation and operation. This same industry can purchase and use many tank cars of benzol or carbon tetrachloride or chlorine, or many other chemicals more reactive and more toxic, with the only restriction that, in some states, if ventilating equipment is used, these plans be approved by the state, and that the official factory inspector, if and when he visits the plant, judges the operation to be safe.

Similarly, the community is apt to regard an atomic energy installation with suspicion and apprehension while accepting or ignoring a chemical operation of equal or greater potential hazard. Different standards of acceptance and performance, and the disordered and confused state of the mechanisms by which society develops the judgments and action in balancing environmental hazards with benefits, can result in discriminatory and even capricious controls. These may even ultimately deprive our society of needed and beneficial goods and services. It is essential that we view the benefits and hazards of atomic energy with the perspective of other comparable activities and their environmental hazards. A number of helpful and provocative examples of such an equilibrium between hazard and benefit, and the mechanisms by which they have become established or accepted in our society, will furnish a useful background for continuing consideration of this relationship with respect to atomic energy.